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(54) ION FUNNEL ION TRAP AND PROCESS

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(57) **ABSTRACT**

An ion funnel trap is described that includes a inlet portion, a trapping portion, and a outlet portion that couples, in normal operation, with an ion funnel. The ion trap operates efficiently at a pressure of ~1 Torr and provides for: 1) removal of low mass-to-charge (m/z) ion species, 2) ion accumulation efficiency of up to 80%, 3) charge capacity of ~10,000,000 elementary charges, 4) ion ejection time of 40 to 200 μs, and 5) optimized variable ion accumulation times. Ion accumulation with low concentration peptide mixtures has shown an increase in analyte signal-to-noise ratios (SNR) of a factor of 30, and a greater than 10-fold improvement in SNR for multiply charged analytes.